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PAPER ON IRRIGATION IN THE SOUTHERN MARATHA COUNTRY

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SELECTIONS FROM THE RECORDS OF THE BOMBAY GOVERNMENT.

IRRIGATION SERIES.—No. IV.

A

PAPER

ON

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IRRIGATION IN THE SOUTHERN MARATHA COUNTRY.

WITH A MAP.

Bombay:
PRINTED FOR GOVERNMENT
AT THE EDUCATION SOCIETY'S PRESS, BYCULLA.

1866.

IRRIGATION

IN THE

SOUTHERN MARATHA COUNTRY.

These papers, which originated in His Excellency the Governor's Minute on "Irrigation" in the Southern Maratha Country, contain the information required therein.

10th December 1865.

MINUTE BY H. E. THE GOVERNOR.

I shall be glad if the Chief Secretary will send a Circular to the Superintending Engineer S. D., and to the Executive Engineers and Collectors named in the margin, and ask them to send in, with as little delay as possible, to the Secretary in the Public Works Department, a list of all projects of which they have any record for large works of irrigation, even if such projects have not been followed by any survey or further proceedings.

Belgaum.
Dharwar.
Kulladghee.

The list should simply describe as generally as possible—

1*st*.—The nature of the project.

2*nd*.—When and by whom projected.

3*rd*.—Whether any and what correspondence or action took place towards getting the project discussed or surveyed, estimated or sanctioned.

4*th*.—Where the correspondence or any further surveys or plans are now to be found.

5*th*.—If the officer referred to has any opinion regarding the project, and the utility of further inquiry or action, Government will be glad of any remarks he may wish to offer.

But the main object is simply to ascertain what has been proposed or suggested, and what has been done or is on record on the subject of irrigation projects in the Southern Maratha Country.

A copy of the Circular should be sent to Colonel Playfair, R.E., Poona. He has, I believe, given much attention to the subject, and I shall be glad of any remarks or suggestions he may have to offer.

The replies of the several officers may be sent to him as they come in for any observations he may be able to append to them, without the delay of reference to former correspondence.

REPORTS.

No. 3942 of 19th Dec. 1865.

Colonel Playfair reported as follows on the subject:—

I have the honour to acknowledge the receipt of your letter and accompaniment dated Camp Koonoor 11th instant. My first impression was to await the replies you mention in your 2nd paragraph, and then to send in my own report, but on further consideration I have thought it better to prepare and send in at once my own suggestions with regard to the Dharwar Collectorate, with which I am intimately acquainted, and then, as the replies to the Circular are sent to me, to append to each separately any remarks that may occur from their perusal.

Dharwar.

I do not think that for the Dharwar Districts any projects for large works of irrigation are in abeyance—none were when I left: all those mooted at any time previous to my taking charge, were taken in hand by me, and definitely settled one way or the other; for instance, for the Mudduk Tank, which had been I may say in a "state of report" for some 30 years, a scheme was projected and carried out; so with the Kalhola Nullah, the dam often before *proposed* was *built*.

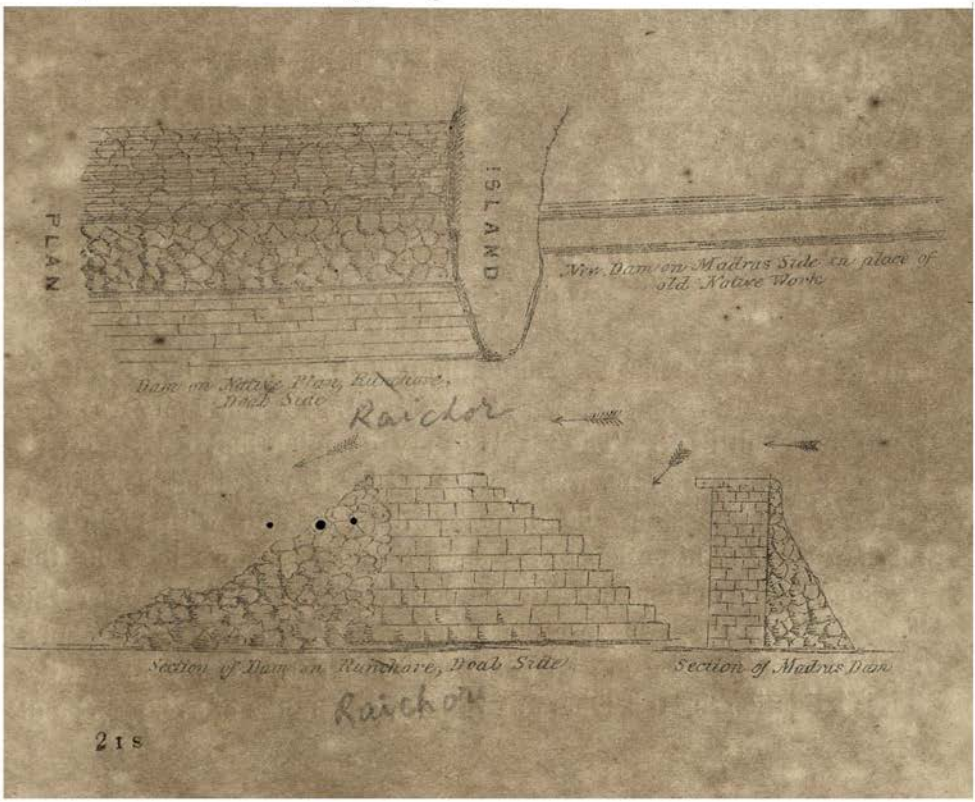
Mudduk Tank.

There were also some petty irrigation projects, locally useful, but not requiring report here, which will be found noted in my final report on the Dharwar Districts, sent to Government in 1862 on my departure for England.

Any large works of irrigation for the Dharwar Districts must be in connection with the Toongbhadra, the Wurda, the Mulpurba, and perhaps the Benihal rivers, and on each of these I will say a few words.

Toongbhadra.
Wurda.
Mulpurba.
Benihal.
} Rivers.

The Toongbhadra, a fine river, carrying a good supply of water at all times of the year, has had, from a village called Koorunhullee, in the Dharwar Districts, to its junction with the Krishna at Kurnaul, no less than 9 dams thrown across it by our native predecessors (some in ruins now however). Those I have seen at the Koorunhullee Wullavapoor are very fine works indeed; they are built with enormous stones laid dry, and looking at the width of the river (in places 800 feet) and the velocity of the stream rushing over the masonry, the boldness of the design strikes the beholder with admiration. There are both faults and good points in these dams: of the one, is the enormous quantity of masonry wasted; of the other, that being laid with open joints, while keeping up a sufficient head of water, the sand and silt filters through and does not choke the bed above; still at Wullavapoor, where the Madras officers have rebuilt the dam on their side of the river, the small quantity of neatly laid cement-jointed masonry, fitted with sluices and perfectly level the whole way across, contrasts advantageously with the enormous quantity of irregular stone work on the opposite side; thus—



Out of the 9 dams across the Toongbhadra, one alone, that at Koorunhullee, lies in the Dharwar Districts; it is breached and useless. Collectors and others have of course on their tours remarked on it and suggested its repair. I took it up amongst other projects. I also met a Madras Engineer officer on the same errand. He suggested, that instead of repairing the Koorunhullee work, a new dam altogether should be built further up at Ungoor, as affording a higher level and better head; I surveyed on my side very carefully for this and reported on it. From the stony, poor nature of the soil, and the rapid rise of the banks from the river, it would not offer any advantage over the Koorunhullee Dam; on the contrary it would necessitate a great length of useless canal. Whether the Madras Engineer got on better on his side I do not know; but I think the Madras Irrigation Company stepping in and proposing great works at the junction of the Toongbhadra with the Krishna at Kurnal, stopped this comparatively petty project. Still the Koorunhullee Dam could be easily repaired, and would be useful, but to the *Raichore Doab*, and not to the Dharwar Districts. The former being foreign territory, its irrigation does not concern us.

The native rulers do not seem to have erected any works above Koorunhullee—at least I have never heard of any; still it would be worth trying whether a weir higher up the river, perhaps as far as Honhully, could not be usefully built; but of this I am not very sanguine, as far as the Dharwar or Bombay Districts are concerned.

Wurda River.

We next come to the Wurda, which in the rains carries a large volume of water, but dries up to a mere thread in the hot season. I don't think any call was ever made for an examination of this stream, but I did so for my own satisfaction, and with the feeling that it was a pity its water could not be utilized. The result of my examination, carried on at times during some years, was that by no *simple* expedient could irrigation of any importance be obtained from it, and with regard to this I would call attention to the fact, that though we have in the neighbourhood the magnificent native dams just mentioned over the Toongbhadra, the two massive structures at Muntgy and Kench Myloor over the Dhurma River (which latter to this day afford the finest irrigation in the Dharwar Zillah), and tanks of every sort and

size all round, there is not a trace of any native work on the Wurda, and I quote as applicable to this the following extract from a note of the Editor of Professional Papers on Indian Engineering on Weirs on the Ganges, No. III., Vol. I., page 393 :—

> "One other point may be noticed: there is no system of irrigation extant in India, so far as I am aware, whether the canal systems of the North-west Provinces and the Punjaub, the ancient system of Madras, or the Tank system of Central India, which is not simply an improvement on the old native system in use almost from time immemorial. Doubtless the improvement has been great, but the leading idea had been first seized upon by our native predecessors. If this be so, and as there are no remains of weirs across any of these rivers, it is, I think, strong presumptive evidence against their applicability to this part of the country. It is easy to say that the experiment should be made, but the experiment would prove nothing unless carried out on a grand scale and at a vast expense, and if unsuccessful, the experiments would be placed in a very unenviable position."

In the views expressed in which I concur.

The ordinary irrigation then, by means of a weir and canal led from it, I look upon as impracticable with any good effect from the Wurda, because—

1. The banks on each side rise too steeply from the river; the canal must either enter at once into very deep excavation, and when at length it got out on the surface, have but a small margin between its bed and the present river.

2. Or it must be carried along the banks of the river within the flood margin, where its channel would soon be destroyed or silted up.

3. That though during the rainy season there is an abundance of water, it soon dries up and becomes utterly scanty when most wanted.

4. And that the absence of any native works (though they abound on other streams in the neighbourhood) show that our practical predecessors in irrigation had been baffled by similar considerations.

There is one way however in which it is possible the Wurda's water might be utilized, viz. by making an enormous tank and taking the irrigation water out at a high level; such works have been proposed in Madras, and I think an examination of the upper part of the Wurda, to see whether the site for a tank affording large water storage could be found, might be made, and the examination should not be confined to the Dharwar Districts, but the Madras frontier should be crossed. I don't think in the Dharwar Zilla itself any appropriate site could be found, but there may be one a little higher up. Jungle or uncultivated land for the site of the tank is required, as if cultivated fields or villages are submerged, the complaint and demands for compensation would complicate and probably nullify the project.

Benihal River.

With regard to the Benihal River or nullah somewhat similar remarks apply. There are no native works on it; at any rate, where it becomes a stream of any magnitude, it carries water only in the rains, and then runs dry almost immediately after the shower is over, and the land through which it passes being the finest cotton soil richly cultivated, the natives have never seemed to desire anything further in the shape of irrigation. I doubt much whether the Benihal would repay a survey even; no storage tank of large dimensions could be made in the level cotton plains, and any dam made in the undulating grounds near its source, would be of small dimensions and only of petty local importance.

Mulpurba River.

Lastly, and to my mind of the most importance as requiring an early examination, is the Mulpurba. I have before this suggested that probably a dam could be combined with the bridge so urgently required on the Belgaum and Dharwar road near Mahamood (or Moogood) Khan's Hooblee. This lies in the Belgaum Districts, and is essentially a work for the Belgaum Engineer's office; but there is another project upon which I once reported, and which has been a source of anxiety to me at times during my stay in England, as turning my attention too closely to the project as placed before me, I neglected, or fancy I neglected, to try a scheme which perchance may yet bear fruit, and which I had always intended to revive when I had the opportunity; a few words will suffice to explain it.

Between Munolee and Somudutee the Mulpurba River has burst through a range of small hills—I write from recollection, but somewhat thus:—

An Assistant Collector, struck with the beautiful situation for a dam the precipitous sides of the ravine bounding the river afforded, suggested one at **A**, and that the water should be let from it into the Nurgoond and Nowlgoond cotton plains; this I found to be quite impracticable, and reported accordingly; that is, no canal could be led from such a dam to the plains in question; but it has always been a source of regret to me, that I did not try whether a canal could be led past the dam along the river in the direction of Konoor where your camp was, as shown by dotted line **a a**. Such a scheme may turn out futile, but I think it would be well worth trying, and I would with pleasure explain what should be done to settle the matter to the officer ordered to take it up, who should be I think the Dharwar Executive, as though Munolee is in the Belgaum Executive Engineer's charge, the irrigation would be principally for the benefit of the Dharwar Zillah.

I regret that I have not at the moment the means of sending a better map of the Dharwar Districts, but I trust the one sent will be sufficient to direct you to the places mentioned, and I would suggest that you should at the same time refer to the Trigonometrical

map of that part of the country, which you probably have, or can easily procure from a neighbouring officer.

No. 133, dated 1st Feb. 1866.

The Collector, A. Grey, Esq., C.S., reported :—

Captain Wingate on the Krishna and Mulpurba Rivers.

In 1852 Captain Wingate submitted to the Collector of Belgaum, in the Report on the introduction of the Revenue Survey into the Badamee and Bagulcote Talookas, proposals to make the Krishna and Mulpurba Rivers available for irrigating the eastern talookas of the collectorate which have since been transferred to Kulladghee. The subject was taken up by Mr. Inverarity, and referred to Colonel Scott, Superintending Engineer, who eventually was authorized to employ two officers, Lieutenant Creigh of the 19th Regiment, and Ensign Connell of the 11th Regiment, to make surveys. Certain operations were concluded, of which there is no record in this office, and there is nothing to show how the scheme was abandoned; but Lieutenant Colonel Playfair, Acting Superintending Engineer for Irrigation, with whom I have been in correspondence on the subject, informs me that all the levels and plans resulting from Colonel Scott's labours were handed over to the Bombay Irrigation Company, and are, it is to be feared, hopelessly lost. The other work of irrigation proposed was a project brought forward by Mr. C. Shaw, when 2nd Assistant Collector, for damming the Mulpurba where it passes through the hills between Kullolee and Katurhall; the proposal was considered, but Colonel Playfair informs me that he himself took some levels which showed that the scheme was impracticable.

After the decided opinions that have been placed on record by Captain Wingate on the great advantages that must result from any well considered plan of irrigating the country from the waters of the Krishna and Gutpurba, it is unnecessary for me to say more than that I have learnt with much gratification that it is in contemplation to appoint an Executive Engineer for Irrigation in this collectorate, and that two Surveyors have been despatched to make a preliminary survey of the Mulpurba, and are to be joined shortly by Colonel Playfair himself.

List showing the Projects for large works of Irrigation in the Belgaum Collectorate, to accompany the Collector's letter No. 133, *dated 1st February* 1866.

Nature of the Project.	When and by whom projected.	Whether any and what correspondence or action took place towards getting the project discussed, surveyed, estimated, and sanctioned.	Where the correspondence and any further surveys or plans are now to be found.
1	2	3	4
1. Making the Krishna and Mulpurba Rivers available for irrigating the Eastern Talookas of the Belgaum Collectorate.	In 1852 by Captain Wingate.	On the project being brought forward, the subject was taken up by the Collector, Mr. Inverarity, and referred to Colonel Scott, Superintending Engineer, who was authorized by Government to employ two officers to make a survey. Certain operations were carried out by these officers, of which there is no record in this office, and there is nothing to show how the scheme was abandoned.	All the plans and levels resulting from Colonel Scott's labours were handed over to the Bombay Irrigation Company, by whom it appears they have been lost.
2. Damming the Mulpurba River where it passes through the hills between Kullolee and Katurhall near Munolee.	In 1855 by Mr. C. Shaw, 2nd Assistant Collector.	The proposition was submitted by Mr. G. B. Seton Karr, Collector, to the Revenue Commissioner S. D., who, after some discussion on the subject, directed that no further steps should be taken with the work in the face of the general prohibition against commencing any work at that time the cost of which would exceed Rs. 10,000.	The correspondence ending with Revenue Commissioner's letter No. 2004, dated 2nd July 1856, is on the records of the Collector, as well as on that of the Revenue Commissioner Southern Division. It appears that one line of levels was taken by the Engineer Department, which showed that Mr. Shaw's scheme was impracticable.

Tabular Statement showing Projects for large works of Irrigation on record in the office of the Executive Engineers Belgaum and Kolapoor, as called for in Chief Secretary to Government's Circular No. $\frac{1524}{2698}$ $\frac{\text{A.C.W.}}{\text{M.A.}}$, *dated* 11*th December* 1865.

Executive Engineer's District Office, Camp Ambolee, 3*rd January* 1866.

No.	List of Projects.	Nature of Project.	When and by whom projected.	Whether any and what correspondence, &c.	Where correspondence and surveys are now to be found.	Opinion, &c.
1	2	3	4	5	6	7
1	"Moodhole Irrigation Scheme."	To irrigate 10,000 acres of Moodhole land and a similar quantity of British Territory. *See* Executive Engineer Belgaum and Kolapore's letter No. 1550 of 16th August 1862, to the address of the Superintending Engineer S. C.	Unknown. The *earliest* letters referred to on the file is the Assistant to the Chief Engineer's No. 8897 of 15th October 1855, to the address of the Superintending Engineer S. P.	Moodhole Irrigation Scheme File *commencing* with a memorandum No. 19 of 9th *January* 1856 from the Acting Executive Engineer B. C., to his Assistants Lieutenant W. W. Goodfellow and Charles R. Atkinson, Esq., and *ending* with Executive Engineer Belgaum and Kolapore's No. 1967 *of 25th October* 1862, to the address of the Superintending Engineer S. C.	Correspondence on the records of the Executive Engineer's office, Belgaum.	Of Captain Merriman, R. E., as expressed in paragraph 16 of a letter No. 1550 of 16th August 1861:— "I think the subject has been fully and fairly investigated, and that I am perfectly justified with the data before me, added to a late inspection of the valley in the neighbourhood of Gokak and Tigree, in pronouncing the scheme to be utterly impracticable."

N.B.—Captain Griffith has no opinion to record.

List of Projects for large works of Irrigation in the Dharwar Districts, by J. Hart, Esq., C.E., Executive Engineer Dharwar Districts, dated 5th January 1866.

Nature of Project.	When and by whom projected.	Correspondence or action which took place about the Project.	Office where the correspondence, surveys, or plans to be found.	Remarks.
Dam across the Birtu nullah near Kulutghee, Hooblee Talooka.	In 1862 by Captain (now Lieutenant Colonel) Playfair.	Mention of it made. Memorandum prepared under instructions from Secretary to Government's letter No. 5696, dated 18th October 1862, forwarded to Superintending Engineer S. D. with Dharwar office No. 813, of 12th November 1862. No action has taken place, as no subordinate could be detailed for the work.	Dharwar office and probably in Secretariat.	I have considerable doubts as to the success of the scheme. I would not advocate its early execution, as until we can prove that its prototype the Kullolee Dam (in the same valley) pays, it would be unexpected to do anything further than make the necessary surveys, which should be made as soon as there is a Surveyor available for the duty.
Dam across the River Mulpurba.	An Assistant Collector, name and date not recorded.	Mention of it in Memorandum referred to above.	Probably in the Belgaum office.	This project belongs entirely to Belgaum, and it does not appear how it was referred to the Executive Engineer Dharwar, except because some of the land to be irrigated was in Dharwar. Captain Playfair writes in the memorandum, "The levels were against any canal being led from it, and this I found when I examined

Nature of Project.	When and by whom projected.	Correspondence or action which took place about the project.	Office where the correspondence, surveys, or plans to be found.	Remarks.
				into the project, which was sent to me for report, as any canal would have watered parts of the Dharwar Districts so low down as Manowlee, then no investigation need be made, but the upper parts of the ~~pier~~ ought to be surveyed, and I think something useful would result, not however to the Dharwar Districts, and therefore the matter is for the Belgaum authorities. It has often occurred to me that irrigation from the Mulpurba River might be combined with the bridge so much wanted ~~in~~ the Belgaum and Dharwar road near Mahomed Khan's Hooblee; the Dam would ~~seem~~ as a foundation to the bridge, which might be erected on light narrow piers, not much obstructing the waterway, crossed by iron girders. I think from the look of the country a canal could be led along both sides the river, but this a survey can alone determine." I have never examined the sites spoken of, but believe the pier has been lately examined by the Madras Irrigation Company.

Toongbhadra River.	In 1857 by Mr. Ogilvie in a demi-official letter to Lieutenant Close.	Report forwarded with letter No. 751, of 2nd November 1858, to the Collector of Dharwar, for transmission to the Revenue Commissioner.	Dharwar office.	This is in Madras, and Captain Playfair who examined the project, writes :— "Some magnificent weirs have been thrown across this river under the native dynasties ; one at Koorunhullee in the Dumbul Talooka is ruined ; its restoration would do scarcely any good to our districts, and be merely of benefit to the Raichore Doab and Bellary country, and no attention need therefore be paid to it by the Dharwar Executive Engineer. Some time ago a project was mooted by the Madras Engineers of building a new weir altogether in place of that at Koorunhullee at Nugoor (or Samwund in the Dharwar Zillah), a village on the Madras side, just below the Wurda River confluence ; this appears to have been given up, in any case it would, from the conformation of the country, do the Dharwar Districts little more good than that at Koorunhullee. In short on our side, sa far as the Toongbhadra River, below the Wurda confluence is concerned, there is no chance of valuable irrigation : the Raichore Doab is alone interested.

The reports of the Executive Engineers were sent to Colonel Playfair for any remarks he had to make. He stated:—

Moodhole Irrigation Scheme.—This was a project started on the following grounds:—

No. 87A, of 7th March 1866. Moodhole Irrigation.

The Rajah of Moodhole, whose territory is situated on the Gutpurba, between Gokak and Kulladghee, offered to pay 1½ lakhs towards any irrigation project that would jointly benefit his own and Government lands, provided Government would give a similar sum, making in all 3 lakhs.

It was considered that this sum would be quite insufficient to carry out the project for a canal from above the Falls, and the Executive Engineer Belgaum was directed to try and find a favourable site for a dam and canal anywhere between Gokak (below the Falls) and Kulladghee, that would jointly benefit the Chief of Moodhole and Government.

In consequence of this order, a longitudinal section was made of the whole river between Gokak and Kulladghee, together with numerous cross sections, and careful investigation into sites for dams, borings being made where necessary; indeed, under the supervision of an Engineer officer, Lieutenant Watson, the whole subject was thoroughly exhausted; it was found that, owing to the *small fall of the river, 14 inches per mile, and the steep transverse slopes of the valley, such a canal as was wanted was quite impracticable,* and this scheme may be considered as finally abandoned.

Irrigation from the Krishna near Gulguleh.—This was a scheme proposed by Captain Wingate. It was surveyed for by Colonel (now Major General) Scott and reported impracticable. There is no doubt from the levels taken that it was so.

Krishna River.

Canal from above the Falls of Gokak.—This is rather obscurely lumped up with the proceedings in Mr. Grey's last item, who by mistake writes Mulpurba instead of Gutpurba.

Gokak Falls.

Major General Scott, after failing at Gulguleh, employed himself and the two officers under him, Lieutenants Creagh and Connell, on making a preliminary survey of a canal from above the Falls of Gokak; the result was, that he reported on the project as an eminently favourable one. It seems that at that time an Irrigation Company was started in Bombay, and General Scott's preliminary surveys were handed over to it, and on its collapsing, never returned. No further action was ever taken in the matter. I have examined the site myself, and prepared instructions for Lieutenant Smith, who is to be my Assistant for Irrigation in these districts. When he arrives, I trust that a matured detail project may soon be prepared for submission to Government. I have recently reported on this scheme to the Revenue Commissioner, and have embodied the greater part of the said report in a general one I am preparing for submission to Government on the irrigation of this part of the country, so I need not enlarge upon it further here.

Mulpurba River.

Damming of the Mulpurba River near Manowlee.—I have just returned from a careful examination of the Mulpurba valley, and will remark upon it in my general report above alluded to as under preparation. I require some additional levels, which are now being taken.

With regard to the Dharwar projects, it will be observed that all the information given is extracted from my own reports. I have nothing to add at present, save that unless something can be done with the Mulpurba, no promising schemes of any large importance offer themselves in the Dharwar Collectorate, but I will speak further of this in my general report, which I will submit, I hope, by the end of the month.

RESOLUTION OF GOVERNMENT.

This precis should be printed, with a Sketch Map, as a volume of Government Selections, and copies sent to Colonel Fife, to the Members of Government, and to the various Public Works and Collectors' Offices in the Southern Mahratta Country. Even when unfavourable, the opinions and information may be useful as preventing further resultless inquiry.

2. It seems that there is one very promising large scheme for the Gutpurba above Gokak falls; one possible one, awaiting further inquiry, on the Malpurba, and some possible sites on the Toongbudra, and perhaps the Wurda high up.

3. It is not apparent why the Krishna project, so well thought of by Major Wingate, was pronounced impracticable. Further inquiry should be made about it.

4. Nothing is said of the extension northwards of the Anagoondy system of Tank Irrigation, so common and useful in the Southern Dharwar districts. This seems deserving special attention.

ERRATA.

Irrigational Series.—No. IV.

For	Page	*Read*
the Koorunhullee Wullava-poor.	5	Korunhullee *and* Wullava-poor.
(Below the sketch in two places) *Runchore.*	Do.	*Raichore.*
Kench *Myloor*	6	Kench *Negloor.*
ancient system	7	*Anicut* system.
(Last line of extract) *experiments.*	Do.	*experimentors.*
(Column of remarks) *Kullolee* Dam.	13	*Kulhalla.*
unexpected	Do.	*inexpedient.*
pier	14	*river.*
in	Do.	*on.*
seem	Do.	*serve.*
pier (again)	Do.	*river.*
(Column of remarks) *Nugoor* or *Samwund.*	15	*Ungoor* or *Sasurwad.*

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